

### ABSTRACT OF THE DISCLOSURE

A method is provided for forming a metal layer on a substrate using an intermittent precursor gas flow process. The method includes exposing the substrate to a reducing gas while exposing the substrate to pulses of a metal-carbonyl precursor gas. The process is carried out until a metal layer with desired thickness is formed on the substrate. The metal layer can be formed on a substrate, or alternately, the metal layer can be formed on a metal nucleation layer.